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(54) EXHAUST HIGH PRESSURIZING DEVICE FOR EGR

(57) Abstract:

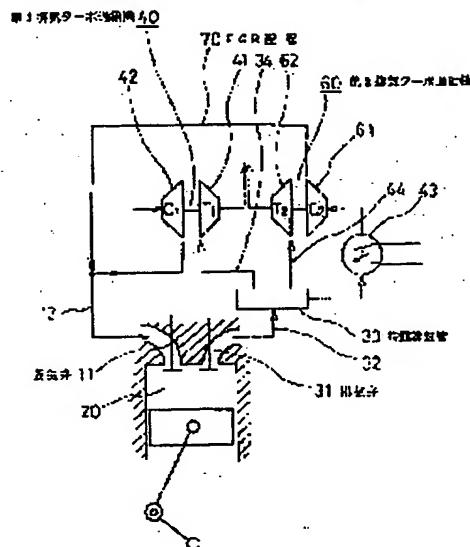
PURPOSE: To realize efficient EGR without making a compressor of a first turbosupercharger dirty due to exhaust gas by providing the compressor for intaking and compressing only exhaust gas, and merging together the compressed exhaust gas for EGR in an air supply tube of a first exhaust turbosupercharger for supercharging an engine.

CONSTITUTION: In an exhaust high pressure device provided with a first exhaust turbosupercharger 40 for supercharging an engine, a second exhaust turbosupercharger 60 exclusive to EGR is disposed. A blower 61 of the second exhaust turbosupercharger is connected on an intake side thereof to a common exhaust tube 33. A discharge tube 70 is connected to an air supply tube 12 of an engine disposed on a discharge side of the blower of the first turbosupercharger, thus carrying out EGR.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to an exhaust air turbo charger internal combustion engine.

[0002]

[Description of the Prior Art] Drawing 2 explains the configuration of the conventional exhaust air turbo charger internal combustion engine's EGR. Drawing 2 is the block diagram of the conventional exhaust air turbo charger internal combustion engine's EGR. Since 11 is [a combustion chamber and 32] all an internal combustion engine's well-known elements in an exhaust pipe in drawing as for an exhaust valve and 20, an inlet valve and 31 omit explanation. As for 33, all an engine's exhaust pipes are connected with the common exhaust pipe. 41 connects an exhaust gas turbine with an exhaust gas turbine inlet pipe, and 34 has connected the exhaust air inlet port of an exhaust gas turbine 41 with the common exhaust pipe 33. 42 is connected with the exhaust gas turbine 41 with the supercharger. 10 leads to atmospheric air with the suction pipe of a supercharger 42 by the inlet pipe. As for 12, the discharge side of a supercharger 42 is connected by the inlet pipe. 35 is opening the common exhaust pipe 33 for free passage to the suction pipe 10 of a supercharger 42 for EGR piping.

[0003] An operation of the conventional example is explained. If an exhaust valve 31 opens during engine operation, the existing combustion gas of a combustion chamber 20 will be exhausted through an exhaust pipe 32, and it will flow into an exhaust gas turbine 41 at the common exhaust pipe 33 through the common exhaust pipe 33 to an assembly and the exhaust gas turbine inlet pipe 34 from each gas column, and this is turned, and it is emitted to atmospheric air. A supercharger 42 is driven by said exhaust gas turbine 41, inhales a part of exhaust air in the common exhaust pipe 33 for a suction pipe 10 to atmospheric air through the EGR tubing 35 with **** atmospheric air, compresses it to charge pressure, and is breathed out to a feed pipe 12. In the usual operational status, ** in the feed pipe 12 supercharged from the pressure of the common exhaust pipe 33 cannot supply exhaust air of the common exhaust pipe 33 to the direct feed pipe 12 highly.

[0004]

[Problem(s) to be Solved by the Invention] Since the charge pressure is higher than an exhaust pressure in performing EGR and exhaust air is not added by the direct feed pipe 12, if it adds to the inlet side of a supercharger, a supercharger will become dirty with exhaust air and the engine performance will fall. Moreover, since high exhaust air of a pressure is expanded to the intake pressure of a supercharger and it compresses with a supercharger from atmospheric air again, the consumption power of a supercharger becomes large, and it becomes the same thing, and an engine performance is worsened as the effectiveness of an exhaust air turbosupercharger fell. The purpose of this invention is offering the 2nd exhaust air turbosupercharger which compresses only exhaust air in an exhaust air exhaust turbocharged engine, and is added to an engine's air supply.

[0005]

[Means for Solving the Problem] A suction pipe carries out opening to an engine's common exhaust pipe

out of the 1st exhaust air turbosupercharger which it has conventionally, and it is characterized by having the 2nd exhaust air turbosupercharger by which the discharge tube joined by the discharge side of said 1st exhaust air turbosupercharger, and was connected with an engine's feed pipe.

[0006]

[Function] A part of exhaust air of an engine is compressed into a pressure equal to the pressure of air supply by the 2nd exhaust air turbosupercharger, and, in addition to an engine's air supply, EGR is performed.

[0007]

[Example] Drawing 1 explains the example concerning this invention. Drawing 2 is the explanatory view of the example concerning this invention. drawing -- setting -- 11 -- an inlet valve and 12 -- a feed pipe and 20 -- a combustion chamber and 31 -- as for an exhaust pipe and 33, since the 1st exhaust gas turbine and 42 are the well-known elements of an exhaust air exhaust turbocharged engine in the 1st supercharger, a common exhaust pipe and 34 omit [an exhaust valve and 32 / the exhaust air inlet pipe of an exhaust air turbosupercharger, and 41] explanation. 62 is connected with the common exhaust pipe 33 by the 2nd exhaust gas turbine for EGR. 61 is combined with said 2nd exhaust gas turbine 62 and same axle with the 2nd supercharger for EGR, and the feed pipe is opened for free passage by the common exhaust pipe 33 through the exhaust air condensator. 60 consists of 2nd exhaust air turbosuperchargers for EGR from the 2nd exhaust gas turbine 62 and the 2nd supercharger 61. 43 is prepared in the inlet side of the 2nd supercharger 61 for EGR with the exhaust air condensator. 70 is opening the discharge side of the 2nd supercharger 61 for EGR for free passage to the feed pipe 12 for EGR piping.

[0008] Next, an operation of said example is explained. An exhaust pipe 44 supplies the exhaust air breathed out by the common exhaust pipe 33 from each gas column which is not illustrated to the 2nd turbine 62. This 2nd exhaust gas turbine 62 turns the 2nd supercharger 61 of the surroundings with said exhaust air. Through the exhaust air condensator 43, the 2nd supercharger 61 compresses this equally to the pressure of a feed pipe 12, and breathes out a part of exhaust air of the common exhaust pipe 33 to the EGR tubing 70. The compressed exhaust air joins by the discharge side of said exhaust air turbosupercharger 40, and the EGR piping 70 sends exhaust air to a feed pipe 12. A feed pipe 12 combines the air which the 1st exhaust air turbosupercharger 40 breathes out, and the exhaust air which the EGR tubing 70 breathes out, and sends it to an engine's inhalation opening. Therefore, a part of exhaust air is mixed by an engine's inhalation of air, and EGR is performed.

[0009]

[Effect of the Invention] Since a part of exhaust air of an engine is ****(ed) to charge pressure, said exhaust air can be mixed to air supply, and EGR can be performed. Since exhaust air does not flow to the supercharger 42 of the 1st exhaust air turbosupercharger 40, it does not become dirty with exhaust air and the engine performance does not fall. Since the 2nd supercharger 61 for EGR inhales high exhaust air of the pressure which is also the source of power of the 2nd exhaust gas turbine 62 as it is, compression-izing is small and its consumption power is small. Moreover, the exhaust air which said 2nd supercharger 61 inhales is cooled with an exhaust air condensator, and since temperature is low, consumption power decreases further. Therefore, this invention can offer the efficient equipment which compresses only the exhaust air for EGR with the 2nd supercharger 61 in an exhaust air exhaust turbocharged engine, and performs EGR in addition to the discharge side of the 1st supercharger 42.

[Translation done.]

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CLAIMS

[Claim(s)]

[Claim 1] Exhaust air high-pressure-ized equipment for EGR which comes to have the 2nd exhaust air turbosupercharger (60) which inhalation opening of the blower (61) of the 2nd exhaust air turbosupercharger (60) carries out opening to said internal combustion engine's common exhaust pipe (33), and the discharge side joins the discharge side of the blower (42) of said 1st exhaust air turbosupercharger in the internal combustion engine which supercharges by the 1st exhaust air turbosupercharger (40), and performs EGR to an engine.

[Translation done.]

第1 排気ターボ過給機 40

